

Claims

- [1] An apparatus for tracking the position of a person/object by using a mobile communication network comprising a plurality of terminals, a base station, a control station, a switching center, a Home Location Register (HLR), a Short Message Service (SMS) server and a position information management server, the apparatus comprising:
- a CDMA wireless transmission and reception element for performing basic CDMA wireless transmissions and receptions in the mobile communication network;
 - a position information extracting element for receiving position information from a GPS satellite and outputting the position information;
 - an emergency call button for outputting an emergency call selection signal when a user performs a PUSH action in case of an emergency;
 - a memory for storing an emergency message and an external notification audio data;
 - a Radio Frequency Identification (RFID) processing element for providing personal information; and
 - a controller for performing the following actions:
 - producing a current position by using the position information extracting element upon receiving a position information call instruction and transmitting the position information to the position information management server;
 - reading the external notification audio data stored in the memory upon receiving an external notification instruction from the position information management server through a short message service and outputting the same;
 - reading an emergency message stored in the memory when the emergency call selection signal has been inputted from the emergency call button and transmitting the same together with the current position information of the user to the position information management server through the short message service; and
 - performing position registration in the HLR by determining position registration using an embedded distance/time standard timer; and
 - a speaker for receiving the external notification audio data including the current emergency of the user and its measures from the controller and audibly projecting out the same.

- [2] A method for tracking the position of a person/object by using a mobile communication network comprising a plurality of terminals, a base station, a control station, a switching center, a Home Location Register (HLR), a Short Message Service (SMS) server and a position information management server, the method comprising:
- a step (100) for the terminal to perform position registration and authentication process to the HLR via the mobile communication network in case it is powered on;
 - a step (200) for the terminal to have a time and distance standard timer initialized, to produce current position, and to be converted into sleep mode;
 - a step (300) for the terminal to determine whether an instruction is input from a position information management server or a user;
 - a step (400) for the terminal to determine whether position registration is performed by using a time and distance standard position registration/determination method for lowering power consumption in case the instruction is not input from the position information management server or the user at step 300, and then to perform position registration to the HLR in case it is determined to be performed;
 - a step (500) for the terminal to be converted into active mode in case the instruction is input from the position information management server or the user at step 300, and then to determine what is the instruction; and
 - a step (600) for the terminal to notify the position information management server of current position information via the SMS in case the instruction is a request for position information received from the position information management server, then to proceed to step 200, and to be converted into sleep mode.
- [3] A method for tracking the position of a person/object according to Claim 2, wherein step 400 comprises:
- a step (401) for the terminal to determine whether an instruction for position registration is requested from the base station;
 - a step (402) for the terminal to register current position information to the HLR, and then proceed to step 200 in case the instruction for position registration is requested from the base station at step 401;
 - a step (403) for the terminal to determine whether the distance standard timer is finished in case the instruction for position registration is not requested from the

base station at step 401;
a step (404) for the terminal to proceed to step 401 in case the distance standard timer is not finished at step 403, and to compute current position and shifted distance from a starting point to a finishing point of the distance standard timer to in case the timer is finished at step 403;
a step (405) for the terminal to determine whether shifted distance from the starting point to the finishing point of the distance standard timer is more than a first critical value;
a step (406) for the terminal to proceed to step (402) and to register current position information in case shifted distance from the starting point to the finishing point of the distance standard timer is more than the first critical value at step (405), and to determine whether the time standard timer is finished in case shifted distance is less than the first critical value;
a step (407) for the terminal to compute current position and shifted distance from the starting point to the finishing point of the time standard timer, in case the time standard timer is finished at step 406; and
a step (408) for the terminal to determine whether shifted distance from the starting point to the finishing point of the time standard timer is more than a second critical value, to proceed to step 402 in case shifted distance is more than the second critical value, and to register current position information.

- [4] A method for tracking the position of a person/object according to Claim 3, wherein the method further comprises a step (409) for the terminal to have the distance standard timer initialized, and then to proceed to step 401 in case the time standard timer is not finished at step 406.
- [5] A method for tracking the position of a person/object according to Claim 3, wherein the method further comprises a step (410) for the terminal to have the time and distance standard timer initialized, and then to proceed to step 401 in case shifted distance from the starting point to the finishing point of the time standard timer is less than the second critical value at step 408.
- [6] A method for tracking the position of a person/object according to Claim 3, wherein the method further comprises a step (700) for the terminal to read voice data for emergency notification containing the user's current emergency and an emergency measure from a memory, and to audibly project the same out via a speaker in case the instruction is for emergency notification received from the position information management server.

- [7] A method for tracking the position of a person/object according to Claim 3, wherein the method further comprises a step (800) for the terminal to read emergency messages from a memory, to transmit to the position information management server the emergency messages together with current position information via the SMS, and then to proceed to step 200 in case the instruction is for emergency call input the user at step 500.
- [8] A method for tracking the position of a person/object according to Claim 3, wherein the method further comprises a step (900) for the terminal to produce current position information, to notify the HLR of current position information, and then to finish a process in case the user tries to power off at any time during each of the steps.
- [9] A method for tracking the position of a person/object according to Claim 3, wherein the first critical value is set to be more than a distance standard position registration optimum parameter, the second critical value is set to be less than a time standard position registration optimum parameter, which is used in a current mobile communication terminal respectively.
- [10] An apparatus for tracking the position of a person/object by using a mobile communication network comprising a plurality of terminals, a base station, a control station, a switching center, a Home Location Register (HLR), a Short Message Service (SMS) server and a position information management server, the apparatus comprising:
a position information processing means for managing position information of a plurality of terminals 100 to transmit a request for position information to corresponding terminal via the SMS upon reception of a request for the user's position information from the protector, and decoding encrypted position information received via the SMS for the protector's reading; and
a notification processing means for transmitting a notification request to corresponding terminal via the SMS upon reception of the protector's request.
- [11] A method for tracking the position of a person/object by using a mobile communication network comprising a plurality of terminals, a base station, a control station, a switching center, a Home Location Register (HLR), a Short Message Service (SMS) server and a position information management server, the method comprising:
a step (1001) for the position information management server to determine what is an instruction upon reception of the instruction from a protector;

a step (1002) for the position information management server to transmit a request for position information to corresponding terminal via the SMS upon reception of a request for emergency notification from the protector at step 1001; and

a step (1003) for the position information management server to transmit a request for position information to corresponding terminal via the SMS upon reception of a request for position information of corresponding terminal from the protector at step 1001, and then to decode encrypted position information received via the SMS for the protector's reading.